of 85 parts oxide and 15 parts oxygen, can be breathed for an indefinite time without danger or injury, producing perfect anaesthesia while thoroughly oxygenating the blood. The effect of the pressure of air in the chamber is simply to concentrate the mixture in the gas-bag into smaller space; and, when thus concentrated, the oxide does the work of producing insensibility, while the air or oxygen of the mixture keeps up the vital processes.

The author gave an historical account of the discovery of this method of administration by Paul Bert in 1878, and its subsequent applications. Having used it for many capital operations, Dr. Howland recommends the system unhesitatingly. Some points of its excellence, in addition to those already mentioned, were stated as follows: By augmenting or diminishing the pressure, the degree of anaesthesia may be regulated at will, and with mathematical precision. Therefore there is no danger of any of the accidents incurred through the use of ether or chloroform. When inhalation of nitrous oxide and oxygen is stopped, the patient recovers consciousness in a few seconds, and feels no subsequent discomfort. The action of compressed air on the surgeon and his assistants is not injurious.

After the reading of the paper, the operation of the system was exhibited. The air-chamber in this case was a tight box with glass sides; and the patient was a chicken. Perfect anaesthesia was produced and proved; and then, after the chicken was restored to consciousness, it was again placed in the chamber, and killed by the administration of unmixed nitrous oxide.

Conscious automatism.

BY C. P. HART OF WYOMING, O.

THE author confined his inquiry to the manifestation of conscious automatism in man. The question was whether the centres in the cortex of the brain were essential to the production of automatic functions of this character. Claiming that the destruction of these cortical centres induces complete and permanent motor paralysis, the author drew the conclusion that conscious automatism depends upon the integrity of that portion of the brain in which arise consciousness and volition.

Prof. E. D. Cope, discussing the paper, hinted that the author had raised the question upon mistaken grounds; that conscious automatism, of necessity, originated in the cortical portion of the brain, but by the influences of use and heredity became so far habitual that it is independent of volitional impulses. The question is evidently not one of automatical origination, but of functional independence.

List of other papers.

The following additional papers were read in this section, some of them by title only: A fact bearing upon the evolution of the genus Cypripedium, by *E. S. Bastin;* Leaves of the Gramineae with closed sheaths, by *W. J. Beal;* Observations on Cephalopoda, by *Alpheus Hyatt;* Position of the Compositae in the natural system, by *Joseph F. James.*

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

National museum.

Priestley's apparatus. — Priestley's chemical and physical apparatus, now in the possession of his descendants in Northumberland, Penn., has been presented by the latter to the National museum, and will be placed in the collection illustrating the history of science.

STATE INSTITUTIONS.

Iowa weather service, Iowa city.

Weather bulletin for July. — The weather of July, 1883, was very favorable to the crops, being fair, nearly normal in temperature, with an excess of rainfall, and southerly winds prevailing.

The mean temperature of the air was but a little over one degree below normal: last year July was nearly five degrees below normal. The number of hot days has been high, especially during the first and last decade, while the middle decade was cool.

Insolation has been high, because, even during the stormy period, cloudy days were rare, and during the month clear days were numerous. The sun thermometer exceeded 140° on twenty-one days; its highest reading was 161°, on the 23d.

The total rainfall was below normal in southern-central Iowa, from Union to Jasper counties: in the balance of the state it was considerably above normal, averaging about six inches in the north-west and in the south-east, and nine inches in the north-east. The highest rainfall, of fourteen inches, for the month, was measured at Decorah. The number of rainy days averaged ten for the east and north-west, and about six for the balance of the state.

As usual during July, very heavy rains have occurred, but only in the north. The highest rainfall measured on one day was nearly six inches, at Homedale, south of Sibley, in Osceola county, on the 23d; next to this stands Algona, Kossuth county, with over five inches on the same date. But the most notable rain period of the month occurred in north-eastern Iowa, from the 20th to the 23d inclusive, giving very nearly ten inches of rain in Howard and Winnesheik counties.

No tornadoes have occurred, but several squalls have visited parts of Iowa; yet the most destructive of these storms have but touched Iowa. The squall of the 4th started about 5 P.M. in central Iowa, and reached south-eastern Iowa about 9 P.M.: it was not very severe. The squall of the 12th started about 6 P.M. in Black Hawk county, reached the Mississippi in Scott and Clinton counties about 9 P.M., doing much damage by wind and hail : it

continued to spread over central Illinois till about 11 P.M. About noon on the 13th another very severe squall started from south-western Iowa, where considerable damage was done in Fremont and Page counties: the storm increased in fury while spreading over north-western Missouri till about 3 P.M. Another storm of less severity visited north-eastern Missouri and southern Illinois on the evening of the same day. A severe squall with hail reached, on the afternoon of the 18th, into north-western Iowa, coming from Dakota. A southerly squall reached Polk and Jasper counties early on the 16th.

On the whole, the weather during July has been very fine: bright skies, aglow with ripening sunshine, alternated with enriching rains, — summed up in splendid crops of small grain and hay, and excellent pastures, and giving promise of a good crop of corn, for the fall season promises well also.

State university of Kansas, Lawrence.

Weather report for July. — In four of the past fifteen years, the July mean temperature has been lower than in this year; but the July rainfall has been but once exceeded during that period (in 1871).

Mean temperature, 76.18°, which is 2.17° below the July average. The highest temperature was 96.5°, on the 23d; the lowest was 56°, on the 9th: giving a monthly range of 40.5°. The mercury reached or exceeded 90° on seventeen days. Mean temperature at 7 A.M., 71.27°; at 2 P.M., 85.71°; at 9 P.M., 73.90°.

Rainfall, 7.23 inches, which is 2.94 inches above the July average. Rain fell in measurable quantities on nine days. There were five thunder-showers. The rain of the 30th yielded 3.10 inches. The entire rainfall of the seven months of 1883, now completed, has been 29.03 inches, which is 7.99 inches above the average for the corresponding period of the preceding fifteen years, and is 1.43 inches above the total rainfall of the year 1882.

Mean cloudiness, 39.46% of the sky, the month being 1.89% cloudier than the average. Number of clear days (less than one-third cloudy), 18; half-clear (from one to two thirds cloudy), 7; cloudy (more than two-thirds), 6. There were three entirely clear days, and three entirely cloudy. Mean cloudiness at 7 A.M., 38.39%; at 2 P.M., 45.48%; at 9 P.M., 34.52%.

Wind: S.W., 39 times; N.E., 15 times; N.W., 12 times; N., 9 times; S., 7 times; W., 5 times; S.E., 5 times; E., once. The entire distance travelled by the wind was 10,901 miles, which is 2,229 miles above the July average. This gives a mean daily velocity of 351.64 miles, and a mean hourly velocity of 14.65 miles. The highest velocity was 40 miles an hour, from 1.30 to 2 A.M. on the 12th.

Mean height of barometer, 29.086 inches; at 7 A.M., 29.111 inches; at 2 P.M., 29.071 inches; at 9 P.M., 29.078 inches; maximum, 29.381 inches, on the 18th; minimum, 28.679 inches, on the 11th; monthly range, 0.702 inch.

Relative humidity: mean for the month, 71.4; at 7 A.M., 80.3; at 2 P.M., 54.7; at 9 P.M., 79.1; greatest, 97, on the 31st; least, 20, on the 2d. There was no fog.

NOTES AND NEWS.

Circumstances were not favorable to the production of remarkable essays at the recent meeting of the American association. The attendance was not large. The officers of the meeting, and especially those who had to make addresses, could scarcely be expected to produce elaborate papers in addition to their other labors. As the number of addresses per meeting has increased, we may observe more readily some of the effects of the system that demands them. The most evident result is, that usually, where we gain one good address, we lose two or three good papers.

The distance of the meeting from their homes affected especially members of sections A, B, C, and D, devoted to the exact sciences. Perhaps it affected the quality as well as the number of their papers. There were not many from the east to present essays, though quite as many as could have reasonably been expected; but there were scarcely any from the locality of the meeting and its neighborhood. Local interest, both as to authors and hearers, was of course deficient. In short, there was nothing remarkable in those sections to spur production, and the product was not remarkable. It was good, but not great.

Some of the papers seem to have lost their way among the sections; a paper that was chiefly botanical having gone before the chemists, and the paleontological papers being divided between biology and geology. In some cases the affinities of authors rather than of subjects may have been consulted, though probably the discrepancy was mostly created in efforts to equalize the amount of work in the different sections.

During the progress of the meeting, it being found that botanists were present in unusual numbers, a botanical club was formed. The immediate object was the organization of botanical excursions. An ultimate object is to arrange for preparing a petition to memorialize congress respecting differences between the rulings of the post-office department as to the sending of plants by mail at home and abroad. The organization of the club was somewhat informal. Prof. W. J. Beal of Lansing, Mich., was appointed president, and John M. Coulter of Crawfordsville, Ind., secretary. The roll was signed by twenty-five botanists who were present at the first session of the club, and their number was increased before the meeting of the association adjourned.

We have before alluded to the singular want of executive ability, or of co-ordination in achieving results, which marred the work of the local committee. That continued throughout the meeting, with many embarrassing results. We again refer to it, not to find fault anew, but to mention that the committeemen themselves acknowledged their blunders most heartily in their farewell speeches, and that their kind intentions were manifest throughout.

— Students of meteorology will be interested in a paper lately read by M. Faye before the French academy of sciences on the whirlwinds of sand observed by Col. Prejevalsky in central Asia. M. Faye believes that such sand-storms, like those of Mexico, India,